UNITED
NATIONS

E

Economic and Social Council

Distr.
GENERAL

E/CN.17/1996/28
6 March 1996

ORIGINAL: ENGLISH

COMMISSION ON SUSTAINABLE DEVELOPMENT
Fourth session
18 April-3 May 1996
Item 4 of the provisional agenda*

FINANCIAL RESOURCES AND MECHANISMS

Note verbale dated 1 March 1996 from the Permanent Representative of Japan to the United Nations addressed to the Secretary-General

The Permanent Representative of Japan to the United Nations presents his compliments to the Secretary-General of the United Nations and, with reference to the forthcoming fourth session of the Commission on Sustainable Development to be held from 18 April to 3 May 1996, has the honour to transmit the Chairman's Summary of the Third Expert Group Meeting on Financial Issues of Agenda 21 held at the Asian Development Bank, Manila, Philippines, 6-8 February 1996, under the co-sponsorship of the Governments of Japan and the Philippines, the Asian Development Bank, and the United Nations Department for Policy Coordination and Sustainable Development.

This was the third in a series of expert group meetings, the first and second of which were held in Kuala Lumpur, 2-4 February 1995, and Glen Cove, New York, 15-17 February 1995. Its purpose was to discuss current financing mechanisms for implementing Agenda 21 and to make recommendations for action for submission to the inter-sessional Ad Hoc working Group on finance and consumption and production patterns of the Commission, to be convened 4-8 March 1996, and to the Commission itself, at its fourth session, to be held 18 April-3 May 1996.

It would be greatly appreciated if arrangements could be made to circulate the attached Chairman's Summary as an official document of the Commission on Sustainable Development at its fourth session under item 4 of the provisional agenda.

---

* E/CN.17/1996/1, to be issued.

96-05496 (E) 060396 070396

/..

Annex

THIRD EXPERT GROUP MEETING ON FINANCIAL ISSUES OF AGENDA 21

CHAIRMAN'S SUMMARY

OVERVIEW

1. The third expert group meeting on financial issues of Agenda 21, sponsored by the Governments of Japan and the Philippines, the Asian Development Bank (ADB) and the United Nations Department for Policy Coordination and Sustainable Development (UN/DPCSD), took place at the Asian Development Bank Headquarters in Manila, Philippines on February 6-8, 1996. The goal of the meeting was to provide the Ad Hoc Intersessional Working Group on Finance and Consumption and Production Patterns of the United Nations Commission on Sustainable Development (CSD) with expert advice on the most promising means of attaining the domestic and external financing requirements of Agenda 21. An additional aim was to provide useful information for preparatory activities of the Special Session for the General Assembly in 1997, which will evaluate progress toward the objectives of Agenda 21.

2. The meeting was attended by sixty-nine experts from governments, international organizations, research institutions, nongovernmental organizations (NGOs), and the private sector. Countries in Asia and the Pacific were the most heavily represented, leading to more emphasis on issues and opportunities in that region, but it was noted that the need for higher levels of finance, and the existence of relevant experience in stimulating financial flows, is not unique to the region. The experts attended in their personal capacities, not as official representatives of their organizations. The meeting was chaired, as on previous occasions, by Dr. Lin See-Yan of Malaysia. The agenda of the meeting and the list of participants are attached.

3. The experts' discussion covered a wide range of topics under the general headings of:

(i) promoting private sector investment in sustainable development

(ii) environmental funds

(iii) implementing environmentally friendly economic instruments

(iv) financing technology transfer

(v) innovative international financial mechanisms

(vi) matrix of policy options and financial instruments

4. This report does not attempt to reflect all the views and suggestions made, nor does it represent a negotiated text. It reflects, nevertheless, the general thrust of the deliberations. Participants agree that it provides a substantive contribution to future discussions in the Ad Hoc Working Group of the CSD and the fourth session of the CSD.

5. Eight points of broad agreement emerged from the meeting:

(I) Financing sustainable development goes beyond the financing of environmental protection and management. It involves the integration of social, economic, and environmental aspects of development.

(ii) Clear, credible, and stable macroeconomic, sectoral, and environmental policies at the national level provide the fundamental basis for mobilizing, and sustaining, domestic and international financial resources for sustainable development.

(iii) The preferred financial instruments are ones that not only raise revenue but simultaneously change production and consumption patterns in ways that promote sustainability. Nevertheless, in practice, there will always be a need for residual financing generated by more general instruments.

(iv) The bulk of financial resources will have to come from, and be invested by, the private sector, including the nonprofit sector. Policies must increasingly shift toward economic instruments to stimulate dynamic private sector involvement on both the supply and demand sides of environmental investments.

(v) Despite the increasingly dominant role of the private sector, official development assistance (ODA) will continue to be a necessary ingredient for sustainable development, especially in the least developed countries.

(vi) To be most effective, available funds from government contributions, ODA, and multilateral financial institutions should promote private sector participation and leverage private capital flows by overcoming market imperfections and other barriers to those flows.

(vii) By engaging the market, a combination of incentive-based policies and targeted technical assistance efforts can simultaneously mobilize financial resources, stimulate technological transfer and innovation, and shift production and consumption toward more sustainable patterns.

(viii) Considerable experience and ongoing experimentation with incentive-based financial mechanisms exist in industrialized and developing countries and economies in transition. There is an urgent need to compile and communicate this information more effectively, especially to policymakers and the public, and to enhance national capacities to identify, develop, and implement appropriate incentive-based policies.

I. PROMOTING PRIVATE SECTOR INVESTMENT IN SUSTAINABLE DEVELOPMENT

6. Official development assistance (ODA) does not appear likely to increase significantly in the near future. Even if it does, its contribution will not be sufficient to meet the external financing needs of Agenda 21. In contrast, private capital flows to developing countries have grown relative to ODA and in absolute terms in recent years. To date, however, these flows have been mostly to a relatively small number of developing countries. There has been little attempt to determine their impact, positive or negative, on national sustainable development financing needs. While international flows have attracted the most attention, the impact of domestic flows should also be analyzed, as they too are a substantial and in many countries dominant source of investment capital. There is therefore growing international interest in analyzing the impact of private capital flows on sustainable development goals, and in identifying and implementing policies and economic incentives to increase and sustain the flow of private capital to support these goals.

7. Expert presentations and discussions on private sector finance identified key obstacles to private investment in environmentally, socially, and economically sustainable projects and programs. In particular cases, obstacles may include some or all of the following: low and inconsistent demand for environmental technologies and services, market and policy risks, limited technical or financial intermediation capacity, a limited menu of financial instruments, information gaps, and/or limited access to technology. At the most basic level, policies and programs must be designed to enable private actors to make potentially profitable investments in sustainable technologies and services at an acceptable level of risk. This requires at least three types of actions.

8. First, governments must provide sound, and predictable, macroeconomic and environmental policy frameworks. Macroeconomic uncertainty and instability, as well as cumbersome procedures for approving foreign investment applications, affect environmental investments as much or more than other investments. Clear, credible, and stable regulations (including economic instruments) for environmental quality and natural resource use, based on broad public consensus and effectively enforced, are essential for stimulating private-sector demand for environmental and natural resource management technologies and services. By setting nationally appropriate environmental objectives, removing policy distortions, and inducing industry to make environmentally friendly production and investment decisions, countries can reduce sustainable development's financing needs.

9. Second, governments and international agencies can undertake specific measures to reduce the market risks, policy risks, and transaction costs associated with investments in environmentally friendly goods and services, including for example waste management, "clean" process technologies, ecotourism and "green" products. Many of these measures can generate

substantial leverage of ODA and other international and domestic public funds. For example, recent experience in Chile indicates that governments can use contract bidding for the provision of waste management services and environmental infrastructure to specify public and private responsibilities and performance requirements, thereby reducing uncertainty about investment opportunities, risks, and returns. Other recent examples come from several Indian states and Central America, where experience in renewable energy investment demonstrates that the lack of national financial and technical intermediaries for small-scale energy projects can be overcome by a phased investment program combining policy reform, technical and contract assistance, demonstration projects, and management training. This points to the existence of opportunities for ODA and other forms of public capital to be used to leverage much greater financial resources. Modest capital investments in e.g. revolving funds for preinvestment studies (with cost recovery from deals that reach closure), lines of credit and other forms of financial intermediation can help overcome the lack of information, risk perceptions, and transaction costs that discourage private investment in environmental projects, particularly small and medium sized projects.

10. Third, at the sectoral and firm levels, national and international agencies can provide information, training, clearinghouse services and marketing assistance (e.g. support for domestic and export trade fairs) to assist the public and private sectors in identifying opportunities for private sector finance and sales. For example, Hong Kong has vast experience in BOO, Build-Operate-Transfer (BOT), and other arrangements for financing a range of infrastructure projects, but its experience is poorly documented and communicated. A different example comes from Sri Lanka, where institutional dialogues have brought together public environmental, industry and finance agencies and private industry organizations to discuss innovative policy proposals (e.g. on deconcentrating industrial sites through joint investment in new industrial estates) and identify promising investment projects. Evidence suggests that these dialogues have stimulated a volume of private investment far in excess of the public resources needed to convene the participants.

11. Several issues require further study. First, more analysis is needed of specific product and service markets and their related capital markets at the national and regional levels. It is important to determine the particular barriers to private investment in order to develop strategies to overcome them, and to gain maximum leverage from public finance. Second, more analysis is needed to assess the potential of innovative supply-side financial instruments, such as "green" venture capital funds, and demand-side policies, such as ecolabelling, preferential duty, tax, and interest rate treatment for the import of environmentally friendly technologies, and the addition of environmental performance criteria to government procurement requirements.

II. ENVIRONMENTAL FUNDS

12. During the past several years, a number of countries, particularly those undergoing the transition from central planning to a market-based economy, have strengthened or created public-sector pollution abatement funds (PAFs). PAFs' revenues come predominantly from charges and fines on polluting enterprises, and their expenditures subsidize enterprise and municipality investments in pollution control. During the same period, a number of developing countries (and some economies in transition) have created conservation trust funds (CTFs) to finance management of protected natural areas, particularly by NGOs and local communities. CTFs are typically set up as endowment funds, with financial resources coming predominantly from external multilateral, bilateral, and non-governmental donors. Recently there have also been several proposals for the establishment of a regional sustainable development fund in the Asia- Pacific region.

13. The rationale for PAFs stems from capital scarcity, weak pollution control regulation, and soft budget constraints for public enterprises. PAFs are second-best solutions to these weaknesses, but there is evidence that they have generated pollution control investments by enterprises and municipalities that would not otherwise have occurred. The major policy issues raised by PAFs are earmarking and capital subsidies. The earmarking of funds generated by pollution charges and fines for pollution control investments violates the polluter pays principle, may hinder sustainable development when the funds could have been invested in higher-yielding social activities (e.g. public health, education), and can potentially lead to a mismatch between investment needs and financial allocations even within the environmental sector. The use of capital subsidies to encourage enterprise investments in pollution control violates the polluter pays principle, may lead to overly capital-intensive approaches to pollution control, and may undermine the development of private capital markets. Due to these potential problems, PAFs are best viewed as second-best, temporary means of overcoming market, policy, and institutional failures that impede environmental investments. Nevertheless, if these problems are adequately managed, PAFs may be the best available option under some circumstances, particularly in transition economies.

14. CTFs are conceptually less problematic uses of public financial resources than PAFs, as they more clearly support the provision of public environmental goods. Experience with CTFs suggests that they can substantially increase the amount of money available for protection and management of natural areas in small countries and countries with very limited public budgetary resources, and can serve as a cost-effective means of delivering donor assistance to numerous small, local-level projects. Because they are usually multi-stakeholder institutions, they may also stimulate collaboration and innovation among groups whose previous interaction has been adversarial. Major concerns include CTFs' heavy reliance on external funding, the high transaction costs involved in establishing them, and their ability to earn adequate returns to attract nonconcessional finance. It appears that they have not fully exploited the willingness-to-pay of developing country publics and international tourists for protection services. In many

cases, they may be the most effective means of capturing this willingness-to-pay, as individuals may be reluctant to pay higher user fees if the revenue is not earmarked for protection of specific areas.

15. Recently, there has also been interest in establishing a regional sustainable development fund for Asia and the Pacific. It has been suggested that capital for such a fund could come from a variety of sources, including private funds leveraged by ODA, and that the fund could support the management of transboundary pollution and shared natural resources, protection of vulnerable ecosystems and remediation of past environmental damage, training and capacity building programs, and other regional priorities.

16. The proposal for the Asia-Pacific regional fund is in the initial stages. Discussion focused on the rationale for the fund (e.g., the presence of regional externalities, such as sulfur dioxide pollution or transboundary fisheries), the risk that it might divert aid resources from other activities (e.g. GEF), and the need for further consultation on its mandate and governance structure. It was proposed that other available funding mechanisms be fully exploited prior to establishing a new regional fund. It was also suggested that experience from other regional funds (e.g. UNEP's Regional Seas Programme) be evaluated to identify useful lessons.

III. IMPLEMENTING ENVIRONMENTALLY FRIENDLY ECONOMIC INSTRUMENTS

17. Sustainable development requires full-cost pricing, which has three aspects: (i) reducing subsidies that are damaging to sustainable development, so that consumers and producers face at least the direct production costs of their decisions; (ii) raising charges on natural resources to levels that reflect depletion costs; and (iii) introducing pollution charges and related instruments (e.g., product charges and tradable permits) to force polluters to pay a price for the environmental degradation they cause. In addition to offering a large potential source of domestic revenue for sustainable development expenditures, these actions provide incentives for producers and consumers to shift their behavior toward more sustainable norms. The presentations and discussions addressed issues related to all three actions.

18. Some countries have made progress toward reducing environmentally damaging subsidies (e.g., ones on energy, water, pesticides, fertilizer), although often not until they are forced to do so by fiscal crises (e.g., in countries undergoing structural adjustment programs). Countries such as the Netherlands and New Zealand that have voluntarily and unilaterally reduced subsidies have apparently not suffered in the international marketplace, nor have countries such as Japan that have refrained from offering their industries and consumers subsidized energy. Even in cases where subsidies are designed to increase social equity, there appears to be substantial potential for cost savings through tighter targeting of subsidies to the

poor. The scope for further subsidy reductions remains enormous, with estimates ranging from hundreds of billions to a trillion dollars annually. Even if funds currently spent on subsidies are not directly rechannelled into sustainable development investments, their reduction will still reduce environmental damage, and thereby reduce the need for funds to finance remediation. Subsidy reduction will also generate funds for saving and investment by reducing deadweight losses in the economy.

19. Considerable scope also remains for countries to generate domestic financial resources by capturing more of the rents from natural resource exploitation. Rents are an attractive revenue source, because appropriately designed fiscal systems can tax rents without causing dead-weight losses. Rent capture is particularly low for timber, with performance in the minerals sectors being substantially better (although recent developments indicate that mineral sector rent capture may be falling due to increasing competition by governments for international private investment).

20. A number of OECD, transition, and developing countries have made significant progress toward implementing charges and tradable permits related to industrial pollution emissions and fuel and vehicle use. A few have even considered global environmental impacts in designing the charges (e.g., carbon-based energy taxes in Sweden and Norway). Although information on actual performance is limited, available research suggests that these economic instruments have generated economic and environmental benefits. The benefits have often been reduced, however, by the charges being set at too low levels or not being effectively enforced. Moreover, the ability of economic instruments to promote cost-effective pollution reduction - that is, to achieve environmental quality objectives at the lowest possible cost to industry - is often constrained by excessive associated regulations.

21. Further progress along all three lines depends greatly on issues of distributional impacts, international competitiveness, and other issues that affect political acceptability. There was broad agreement on the need to move beyond general and theoretical arguments in favor of subsidy reduction and cost internalization toward the development of practical strategies for educating policy makers, business leaders, and the public of the benefits of these policy reforms. Most important, the group agreed on the need to develop a body of nontechnical findings and recommendations based on actual use of instruments in a variety of sectors and national settings. In the longer term, it may be useful to develop "environmental economic literacy" programs for government agencies, businesses, and the general public. There was a suggestion that ultimately, further progress may require voluntary, multilateral consultations among interested governments (as discussed at the Second Expert Group meeting) to enable countries to coordinate their actions and thus reduce the risk of negative impacts on competitiveness.

22. The group also discussed the costs and benefits of phasing the introduction of full-cost

pricing policies to reduce "adjustment shock." Phased, gradual implementation may increase political feasibility, but it may also increase policy uncertainty due to change of government, and it may delay action in ways that result in higher overall adjustment costs.

23. There was also discussion of the tradeoffs involved in earmarking public revenues from environmental charges for environmental purposes. Earmarking can increase political feasibility, but it may not be the most efficient use of funds for either general social welfare purposes or for environmental improvement, particularly when there is no direct link between payment and environmental service provided. (When this link occurs, the payment is in effect a user fee, as in the case of direct charges for wastewater treatment or entry fees for parks). Earmarking also closes off the option of using environmental revenue to shift the overall tax base away from "goods" (e.g., income) toward "bads" and, in the case of pollution, undermines full-cost pricing (as the charge is what polluters owe to society for use of the environment after they have made abatement investments). In the case of natural resources, full earmarking of revenue from rents can be expected to lead to excessive investment in resource management. While earmarking is generally to be avoided, it is justified if it is the only feasible option for assuring the financing of economically and socially justified environmental expenditures.

IV. FINANCING TECHNOLOGY TRANSFER

24. International interest in financing technology transfer for sustainable development has focused on three issues: first, using limited public resources to leverage private sector investment in environmental technology; second, encouraging the development and transfer of industrial process technologies that increase efficiency in input use and reduce the production of waste products (shifting the focus from end-of-pipe pollution control to pollution prevention); and third, developing new financial incentives to achieve these two goals. The second issue is particularly important in rapid industrializing regions like East Asia, where the industrial capital stock is turning over extremely rapidly (a recent World Bank study estimated that in the year 2010, 75% of Asian capital stock will be less than 15 years old) and providing a huge opportunity to avoid large future compliance and clean-up costs by "building in" cleaner production approaches. Presentations and discussion explored these three issues through an examination of the evolution of markets for environmental technology in developed and developing countries, barriers to technology transfer and development, and innovative mechanisms for financing transfer and development.

25. In developed countries, the market for environmental technologies emerged as a result of pollution-control laws and regulations introduced in the 1970s. During the early 1990s, the private market in environmental technologies matured, and in the mid-1990s profits and investment have stagnated and in some cases declined due to uncertainty about the future evolution of environmental policies and regulations. Future investments will likely focus on

improved process technologies. Experience from Italy, among other countries, indicates that cleaner process technologies can reduce both pollution and processing costs. There is a need to strengthen this incentive by shifting the emphasis of environmental regulatory programs toward greater use of economic instruments, which provide industries more flexibility in determining cost-effective means of achieving environmental objectives.

26. In developing and transition economy countries, market development is at an early stage, with most technologies purchased or licensed from developed country suppliers. It was pointed out that the market for environmental technologies is likely to grow particularly rapidly in Asia over the next 10-20 years, driven by the massive investment in new industrial capital stock. Opportunities will be particularly great in the energy, water, and waste management sectors.

27. Despite the presence of a well-established industry in the developed countries and strong and growing demand in many developing and transition economy countries, there are still significant barriers to the transfer, development, and commercialization of environmental technologies. The most fundamental barrier is technology suppliers' perceptions of low rates of return. The environmental technology industry is reluctant to enter a market when demand for its products is uncertain. The level and stability of demand depends in large part on the presence of effective national environmental policies and regulations. Strengthening environmental policies is thus critical to developing countries' efforts to attract improved technologies. It was suggested that well-designed economic instruments may generate more stable and sustainable demand than traditional command-and-control regulations.

28. Technology transfer and development are also impeded by several types of market imperfections. First, although environmental technologies are often not particularly high tech, they need to be tailored for particular uses, and this specialized character makes it difficult for potential buyers and sellers to identify each other. These barriers are particularly high for small and medium enterprises. Second, even where potential buyers and sellers can locate each other, potential sellers remain concerned about enforcement of patents and licensing agreements, particularly for formulae and process technologies which may be a major source of competitive advantage. Payments for technology are the necessary return on years of research and development. Third, development and commercialization of environmental technologies within many developing and transition economy countries is constrained by limited private and public funding for research and development programs.

29. Discussion of strategies to overcome obstacles to technology transfer and development identified several promising initiatives, in addition to improving environmental policies. UNEP's International Environmental Technology Center is a recent initiative to assist local governments in developing countries to identify and acquire urban and freshwater environmental management technologies. Bilateral programs, for example the US-Asia

Environmental Partnership, are assisting government and private sector actors in integrating environmental criteria and technological solutions in energy, water, and waste management investments. Experience with these and other public-private partnerships suggest that they can be effective in overcoming information and transaction cost barriers to technology transfer and development. As emphasized above, they are most likely to be effective when they are supported by national macroeconomic, trade, and environmental policies that reduce market and policy uncertainty and create strong demand for environmental technologies. Some participants also encouraged further exploration of proposals for the establishment of a publicly-supported "green technology fund." Such a fund could purchase technology patents and licensing rights and make them widely available in the public domain.

V. INNOVATIVE INTERNATIONAL FINANCIAL MECHANISMS

30. Meeting the external financing requirements of Agenda 21 is a major challenge for the international community. As noted elsewhere, although ODA is an essential ingredient, it is unlikely to contribute more than a fraction of external financing needs. Over the past several years, international and national agencies and experts have devoted considerable attention and effort to identifying and analyzing mechanisms for mobilizing new and additional sources of external finance.

31. The expert group discussed several recent proposals for national taxes on carbon emissions, air transport, and foreign exchange transactions. They also noted the need for continuing efforts by multilateral development banks and aid agencies to integrate sustainable development goals and increase the financial leverage of public resources through innovative public-private partnerships.

32. Proposals for international taxes share a general conceptual framework: taxing economic activities that have negative global impacts (not necessarily limited to environmental impacts), and using the resultant revenue to finance sustainable development activities. The revenue and incentive impacts of particular taxes depend on level of the tax and the price elasticity of supply and demand for the activity being taxed. Some tax proposals, particularly the carbon tax, have potentially strong revenue and incentive effects. Others, particularly the air transport and foreign exchange taxes, appear to have relatively weak incentive effects, but substantial revenue-raising potential.

33. There was broad agreement that a carbon tax is a highly desirable tool because of its great incentive and revenue-raising potential. It could be levied on fossil fuel use, based on carbon content, and collected at the national level. A portion of the revenue collected could be used for domestic purposes, with the remainder channelled to international investments,

especially ones linked to reducing the risk of global climate change. The distributional impacts of the carbon tax might be highly uneven, however. To offset these impacts and related adjustment costs, a portion of the international revenues could be earmarked for countries bearing the highest adjustment burdens. The group recognized that short-run competitiveness concerns and concern about distributional impacts pose major obstacles to political acceptance of such a tax. There was broad agreement on the need to strengthen the case for a carbon tax by targeted education and information programs, including outreach to government agencies, political leaders, business and civic groups, and the media.

34. A tax on airline transportation has also been suggested in several fora. The group noted that the incentive effect of such a tax is not clear if it is assessed on airline revenue, and that its impact as a pollution reduction incentive would be greater if the tax were levied on the emissions of airline fleets, or on fuel consumption, rather than on revenues or passenger miles. Concerns were also raised about the relatively small contribution of airline travel to greenhouse gas emissions. On the other hand, there is no one dominant source of greenhouse gas emissions, and no reason in principle not to tax air travel along with other sources of emissions.

35. The group also discussed the potential revenue and incentive impacts and political feasibility of a tax on foreign exchange transactions (the "Tobin tax"). The initial rationale for the tax (in the 1970s) was to reduce speculative volatility in foreign exchange markets. Recent volatility in international capital markets has revived discussion of this tax. There has also been discussion of how its proceeds might be spent, including discussion of the possibility of using proceeds to finance sustainable development activities. Recent UNDP-supported research suggests that a tax of less than 0.5% levied on private foreign exchange trades and collected by national governments could generate approximately $150 billion per year, and could lead to modest reductions in exchange rate volatility. Part of the revenue could be made available for sustainable development investments. The group discussed several concerns about such a tax. First, it is not clear that foreign exchange market volatility is always negative. In some cases, it may provide important information to governments and the private sector about the need to clarify and stabilize monetary, fiscal, and exchange rate policies. Second, the degree to which a tax of the order proposed would reduce volatility is not clear. Third, it is not clear how much a foreign exchange tax would distort non-speculative decisions to invest in foreign exchange instruments, causing efficiency losses in trade and investment. Fourth, although there is no economic objection to using revenue raised from one sector to fund another, the lack of a clear link to sustainable development does raise questions about the appropriateness of using a capital markets tax for sustainable development activities. Further studies are needed to clarify the rationale for and potential impacts of the Tobin tax and to evaluate collection and disbursement options.

36. Discussion also stressed the need for continuing efforts by international financial institutions and aid agencies to integrate economic, social, and environmental criteria in all of

their programs in order to promote sustainable development. Previous discussions of private sector capital mobilization (section I above) and technology transfer (section IV above) highlighted many opportunities for increasing the leverage of international public funds by promoting private sector co-finance, and by working more closely with small and medium enterprises and NGOs.

VI. MATRIX OF POLICY OPTIONS AND FINANCIAL INSTRUMENTS

37. The "matrix approach" to policy analysis for sustainable development identifies a range of policy options appropriate for financing sustainable development activities in particular contexts. It facilitates policy analysis by showing how different types of policy options (e.g. property rights, taxes, subsidy reductions) can be applied at different levels of governance (e.g. national, regional, global) and economic activity (e.g energy, agriculture, waste management). The matrix approach offers several advantages. First, it responds to the need for action at multiple levels of governance and economic activity by identifying options at several levels. Second, the matrix indicates how actions at multiple levels can be integrated across and within levels to achieve complementarities and synergies. Third, in so doing it identifies opportunities for minimizing administrative costs by deploying the most concise set of instruments needed to achieve investment objectives. Fourth, within each cell it provides a summary of promising opportunities, and associated experience, with financing related to specific sectors, sources, and instruments. Fifth, in so doing, it provides a menu from which decisionmakers in the public and private sectors can quickly review the full range of options available and select those that are most appropriate. Sixth, the presentation of a range of options is important for the additional reason that a series of instruments is likely to be necessary in any particular case to ensure cost-effective financing (particular instruments are typically most cost-effective only within a specific range). Seventh, it ensures a balance between financial needs and financing options.

38. The presentation highlighted actual experience with incentive-based financial mechanisms. More than thirty countries worldwide have implemented innovative mechanisms, with more than two-thirds having moved beyond the experimental stage toward broad-based implementation. The numbers are considerably larger if more traditional incentive mechanisms, such as subsidy reductions and pollution charges, are included. Experience indicates that implementation has generated social as well as economic and environmental benefits.

39. Discussion focused on suggestions for improving the matrix approach, including: (i) developing more precise estimates of the actual magnitude of environmentally damaging subsidies, current and projected environmental damages associated with economic activity, and the benefit-cost ratio for environmental investments and economic instruments; (ii) incorporating more explicit links to conventional regulatory approaches and the stimulation of

technological innovation and changes in production and consumption patterns; and (iii) converting the matrix into a user-friendly, easily-accessible, computer-based information system.

RECOMMENDATIONS FOR ACTION

40. **Private capital flows** - To mobilize and sustain flows of private capital from domestic and international sources for investments in sustainable development, governments should protect private property rights; adopt macroeconomic and environmental policy frameworks that are clear, credible, and stable; make greater use of BOT, BOO, and similar mechanisms for financing environmental infrastructure; and consider including environmental criteria in their procurement requirements. International financial institutions should offer more line-of-credit facilities linked to sustainable development activities, implement innovative approaches utilizing not just their debt and equity participation but also other mechanisms that are commonly used in other sectors (e.g., cofinancing and guarantees), and in other ways leverage new and additional private capital participation. At the more micro level, international agencies and financial institutions, governments, the private sector, and NGOs should work together to develop and implement technical assistance programs that reduce transaction costs, market risks, information gaps, concerns about unauthorized replication of technology, and other impediments obstructing these flows. Program elements might include establishing revolving funds for preinvestment studies, strengthening information clearinghouses, disseminating case study research on innovative investment arrangements, and preparing regional and national investment action plans.

41. **Pollution abatement funds** - To ensure that earmarking and soft finance do not lead to misallocation of funds, pollution abatement funds should make greater use of project evaluation techniques like benefit-cost analysis and cost-effectiveness analysis, require cost-sharing by fund recipients, and increasingly "harden" their disbursement terms. Funds that are structured as comprehensive funds (i.e., ones that are not limited to expenditure on pollution abatement), as in many transition economies, should increasingly shift their expenditure toward more legitimate public goods, such as nature protection. International organizations and international financial institutions should provide technical assistance to assist funds in making these changes.

42. **Conservation trust funds** - To identify the conditions under which conservation trust funds can be cost-effective mechanisms for protecting natural areas, a detailed cross-country performance review should be undertaken. The study should add to existing, predominantly descriptive information by evaluating the institutional requirements, setup costs, operational performance, and domestic and international resource mobilization potential of a representative sample of funds. It should compare the performance of funds with the performance of

governmental conservation programs financed through standard budgetary and aid channels.

43. **Regional sustainable development funds** - To further investigate the desirability of establishing regional sustainable development funds, a feasibility study for one or more regions should be conducted. The study should investigate the rationale for such funds (i.e., the existence of regional externalities not currently addressed by other funds, e.g., the GEF), the ability of such funds to maximize the use of partnerships with the private sector and NGOs, the risks that such funds might divert financial resources from existing bilateral and multilateral initiatives, and the scope for increasing the net availability of financial resources for cost-effective initiatives.

44. **Economic instruments** - To promote sustained private sector involvement in the financing of sustainable development and the transfer of environmental technology, and to reduce the cost of environmental protection, governments should increasingly shift their regulatory approach toward economic instruments. They should pay particular attention to opportunities to make this shift provided by broader tax reform efforts. To increase governmental and public understanding of the potential benefits of this shift, case studies of practical experience at the local, national, and regional levels (which is considerable) should be commissioned. The case studies should take full advantage of information in existing studies. Dissemination of the case studies should be combined with targeted technical assistance programs that allow interested agencies to share experience, develop analytic and implementation capacity, and undertake pilot projects to determine how economic instruments need to be adapted to particular circumstances and contexts.

45. **Subsidy reduction** -To move domestic and international market prices toward full-cost pricing levels, governments should implement targeted reductions of subsidies that reduce economic efficiency and cause environmental degradation. To determine the appropriate targeting, timing, and administration of subsidy reduction, studies of previous experience with subsidy reduction, e.g. under programs of structural adjustment and for compliance with international trade agreements, should be conducted. These studies should examine the magnitude of subsidies, the technical, political, and administrative strategies adopted to reduce them, the economic, environmental, and social impacts of reduction both domestically and internationally, and opportunities to delink subsidies from environmentally damaging activities while maintaining financial support for subsidy recipients, particularly those in socially vulnerable groups (e.g., by switching to direct income support). The results of this case study research should be combined with targeted programs of technical assistance that assist governments in developing pilot subsidy reduction projects at the local and/or regional level.

46. **Financing technology transfer** - To create a more predictable and "investor friendly" market that will facilitate technology transfer, especially the transfer of cleaner and safer technologies, governments should follow the general strategy outlined in para. 40 above, viz.

protect private property rights, adopt clear, credible, and stable macroeconomic and environmental policies (especially ones based on economic instruments), and consider including environmental criteria in their procurement requirements. In addition, international agencies and financial institutions, governments, the private sector, and NGOs should work together to protect against patent and license infringement, and to develop and implement technical assistance programs that help buyers and sellers of technology identify each other, reduce preinvestment costs by providing technical, financial, and legal expertise, and identify and support projects that demonstrate and commercialize environmentally sustainable technologies in specific sectors.

47. **National carbon taxes** - To reduce emissions of both global pollutants (e.g., carbon dioxide) and local pollutants (e.g., sulfur dioxide, particulates, and hydrocarbons), to reduce discrimination against renewable energy sources, to promote transfer of energy technologies, and to raise revenue for direct investments in sustainable development activities, more countries should consider implementing national taxes on the carbon content of fossil fuels. To increase the political feasibility of these taxes, studies of the economic and environmental benefits of carbon taxes in countries that have implemented them, or are considering implementing them, should be undertaken.

48. **Voluntary, multilateral consultations on subsidy reductions and introduction of national carbon taxes** - To minimize the potential distributional and competitiveness impacts of some of the policies recommended above, especially those related to subsidy reductions and national carbon taxes, interested governments should consider initiating voluntary, multilateral consultations for taking these steps toward sustainable development. This proposal was discussed in detail at the Second Expert Group meeting; more information is contained in the report of that meeting.

49. **International Financial Mechanisms** - to finance sustainable development activities on a global basis, taxing/charging economic activities that have identifiable negative global environmental impact in particular should be seriously considered, despite the lack of an international mechanism to do so. Proposals such as the carbon tax (collected at national level but with pre-determined criteria for global revenue sharing, on a earmarked basis) offer strong possibilities; while others (e.g. charge on international air transport) need clearer rationalisation and amplification in terms of their incentive effects despite significant revenue-raising potential. Still others (e.g. Tobin tax) require more detailed examination in order to qualify as a serious option.

50. **Matrix approach to policy instruments for financing sustainable development** - To assist governments and other sustainable development stakeholders in more easily identifying, learning about, and sharing experience with policy options for financing sustainable development, the development of a world wide web site for the matrix should be supported.

The web site should be maintained as a continually updated database of specific examples of the use of economic instruments in a wide variety of sectors, regions, and levels of government. It should be structured in such a way that users can electronically access increasingly detailed information about actual applications of policy instruments by exploring different levels of the matrix. Information should include both positive and negative aspects of implementation experience, as well as institutional obstacles and how they were overcome. To strengthen the value of the matrix approach, support should be provided to modify it to depict more explicitly the links among instruments (including more conventional regulatory approaches), technology transfer, and changes in consumption and production patterns. Support should also be given to develop and disseminate macroeconomic models for simulating the economic, financial, social, and environmental impacts of alternative packages of economic instruments at the sectoral, national, and global levels.